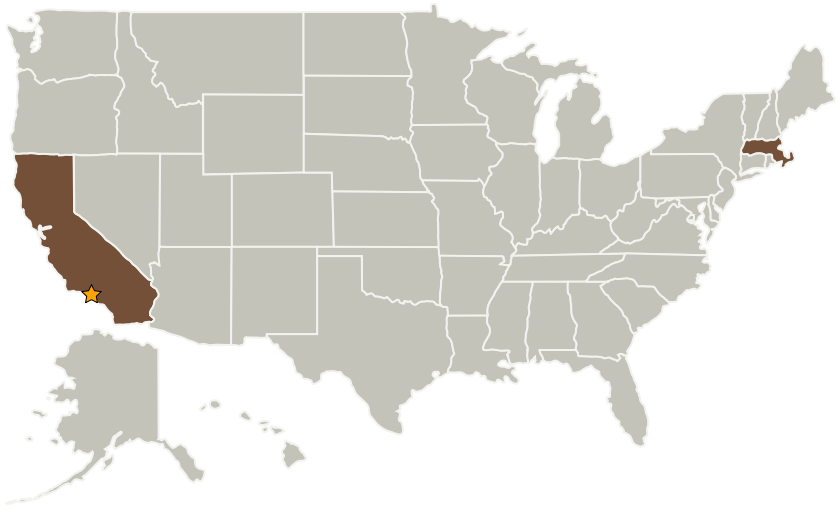
Long Burst Error Correcting Codes, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

Long burst error mitigation is an enabling technology for the use of Ka band for high rate commercial and government users. Multiple NASA, government, and commercial programs plan to use the Ka-band due to its large capacity and flexible scheduling relative to other bands such as S, X, and Ku. Current digital communications systems have become increasingly adept at managing degraded channel conditions using robust FEC codes and strategies such as adaptive or variable coding and modulation (ACM/VCM). These strategies do not adequately address long burst error conditions on the order of 100,000 symbols. Existing FEC codes of up to 16,000 symbols are inadequate. New methods to address this fast fade or burst error condition must be considered. In phase 1, we identify solutions to address long burst errors within the power and size constraints of a satellite application. In Phase 2, we modify an existing platform to demonstrate performance under real-world conditions and study the interaction of these mitigation methods with higher layer protocols.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Innovative Communications Engineering	Supporting Organization	Industry	N. Chelmsford, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.6 Ground Computing
    - TX11.6.5 Public Cloud Supercomputer